PATENT
Docket No.: ST97001CI1(209-US-CI1)
09/498,893

REMARKS

STATUS SUMMARY

Claims 1-44 are pending in the present application. Claims 30-38 are rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. The Examiner has rejected claims 1, 2, 5, 6, 8-10, 12, 22, 23, 24, 26, 27, and 29 under 35 U.S.C § 102(e) as being anticipated by *Cahn et al.* (U.S. Pat. No. 6,198,765), and has also rejected claims 3, 7, 11, 14, 15, 17-21, 24 and 28 under 35 U.S.C §103(a) as being unpatentable over *Cahn et al.* Further, the Examiner has rejected claims 39-42 and 44 under 35 U.S.C §103(a) as being unpatentable over *Cahn et al.* in view of *Langberg et al.* (U.S. Pat No. 5,852,630). The Examiner has also objected to claims 17-21 because of certain informalities. Claims 4, 13, 16, 25 and 43 are allowable if rewritten in independent form including all limitations of the base claim and any intervening claims.

These formal matters identified in the Office Action are addressed herein below.

RESPONSE TO OBJECTIONS TO CLAIMS

The Examiner has objected to the claims 17-21 with the suggestion that the reference to "claim 13" be changed to "claim 15." Applicants concur and claims 17-21 have been amended accordingly.

The above-noted amendments to claims 17-21 are believed to be fully supported by the specification as originally filed. Accordingly, no new matter is believed to have been added.

In view of the foregoing, Applicants respectfully submit that the objections to claims 17-21 have now been overcome, and therefore request that the Examiner's objections be withdrawn at this time.

RESPONSE TO CLAIM REJECTIONS UNDER 35 USC § 101

The Examiner has rejected claims 30-38 under 35 U.S.C. § 101 because the claimed invention is directed to non-statutory subject matter, specifically, a "computer data signal embodied in a carrier wave." The Examiner states that these claims are directed towards a data signal that merely consists of "1" and "0" to represent the coded signal.

Applicants respectfully traverse this rejection. Reviewed as a whole, and given its broadest reasonable interpretation, claim 30 is a statutory article of manufacture claim. It recites a computer program embodied on a computer-readable medium – the carrier wave -- with two claim limitations: "a receiving source code segment comprising means for receiving signal data; and a processing source code segment comprising (i) means for providing a Doppler shift correction value, and (ii) means for processing coupled to the receiving means, providing means and the code signal input, the processing means operable to shift the signal data by the Doppler shift correction value and to determine a correlation between the shifted signal data and the code signal input."

To summarize what is set forth in the Manual of Patent Examining Procedure ("MPEP") § 2106 and the Appendix to Examination Guidelines for Computer-Related Inventions (page 2100-23), the claimed invention in claims 30-38:

(a) has a practical application -- the claimed invention processes signal data in a data signal by shifting the signal data by a Doppler shift correction value and determining a correlation between the shifted signal data and the code signal input;

(b) is in the technological arts, i.e., the disclosed invention uses a general purpose computer system for processing communication data;

(c) is not a computer program *per se* because it is not a mere program listing; the claims define a functional relationship between the computer program and other elements that permits the computer program's functionality to be realized;

(d) is not a data structure *per se* because the claimed invention clearly does not define a data structure;

(e) is not merely non-functional descriptive material because, as noted in subparagraph (c) above, the disclosed invention defines a functional relationship between the computer program and other elements that permits the computer program's functionality to be realized;

(f) is not a natural phenomenon; most likely, a "computer data signal" would not occur as a natural phenomenon and absent evidence to support it, such a position is untenable;

(g) is not a series of steps to be performed on a computer because it does not describe a method of processing communication data; and

(h) is a specific machine or manufacture because it describes a specific article of manufacture, i.e., a computer program with two claim limitations embodied on a computer-readable medium, the carrier wave.

Moreover, claim 30 is similar to claim 13 in the Examination Guidelines for Computer-Related Inventions, Example: Automated Manufacturing Plant (hereinafter referred to as the "Automated Manufacturing Plant Example"), that characterizes such a claim as a statutory article of manufacture claim. Claim 13 of the Automated Manufacturing Plant Example is "[a] computer data signal embodied in a carrier wave comprising: a. a compression source code segment comprising ... [recites self-documenting source code]; and b. an encryption source code segment comprising: ... [recites self-documenting source code]." This claim is characterized as a statutory article of manufacture claim in the Automated Manufacturing Plant Example. Claim 34 is similar to claim 30, with claims 35-38 and 31-33, respectively, being dependent claims thereof.

Therefore, based on MPEP § 2106, the Appendix to Examination Guidelines for Computer-Related Inventions (page 2100-23), and the Automated Manufacturing Plant Example, Applicants believes that claims 30-38 are clearly directed to statutory subject matter and thus respectfully requests that the rejection of claims 30-38 under 35 U.S.C. § 101 be withdrawn.

RESPONSE TO CLAIM REJECTIONS UNDER 35 USC § 102(e)

The Examiner has rejected claims 1, 2, 5, 6, 8-10, 12, 22, 23, 24, 26, 27 and 29 under 35 U.S.C §102(e) as being anticipated by the *Cahn et al.* patent (U.S. Pat. No. 6,198,765). MPEP § 2131 provides:

> "A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). ... "The identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). The elements must be arranged as required by the claim, ...

The *Cahn et al.* patent does not teach each and every claimed element of claims 1, 2, 5, 6, 8-10, 12, 22, 23, 24, 26, 27 and 29. Therefore, Applicants respectfully traverse these rejections.

CLAIM 1

The Examiner states: "[r]egarding claim 1, *Cahn et al.* discloses a system (Fig. 5) for processing communication data from a code signal input (C/A codes), the system comprising:

a signal sampler (Fig. 3, block 73, column 11, lines 26-39) operable to receive signal data;

a Doppler shift system (Figs. 5, 6 and 9, block 108, column 17, lines 1-40, and column 18, lines 55-67) operable to provide a Doppler shift correction value;

a time domain signal processor (Fig. 5, block 102, column 15, lines 36-60) in signal communication with the signal sampler, the Doppler shift system and the code signal input, the time domain signal processor operable to shift the signal data by the Doppler shift correction value and to determine a correlation between the shifted signal data and the code signal input (C/A codes).

In response, Applicants respectfully disagree that the *Cahn et al.* patent teaches each and every aspect of the claimed invention in claim 1 either explicitly or impliedly as required under 35 U.S.C. § 102(e) and MPEP §§ 706 and 2131. As an example, the

Examiner has determined that the Doppler shift system of the second limitation of claim 1 is described by the 12 channel Doppler block 108 referred to in column 17, lines 1-40, and column 18, lines 55-67, and shown in FIGS. 5, 6 and 9, of the *Cahn et al.* patent.

FIG. 6 of the *Cahn et al.* patent is a functional block diagram of the Doppler block 108. With reference to FIG. 5, I and Q signals, after being processed by CACAPT 104 (the C/A code acquisition, tracking and reacquisition block), "are rotated for Doppler shift in 12 channel Doppler Block 108 which separately compensates for the expected Doppler frequency shifts of each of the 12 SVs (Space Vehicles) which can be tracked." [Col. 15, lines 38-43.] The Doppler rotated I/Q signals for each SV are then applied to Correlator Block 110, shown in FIG. 8, where the I/Q signals are correlated using exclusive OR (or NOR) correlators as provided in FIG. 3. Thus Doppler block 108 applies the Doppler correction to the signal samples after demodulation in the IF removal stage and before the signal samples are accumulated in the time domain signal processors. This is typical of a conventional spread spectrum receiver, as noted in the specification, page 3, lines 17 to 22.

In contrast, the second limitation of claim 1 refers to a Doppler shift system operable to provide a Doppler shift correction value. The third limitation of claim 1 refers to a time domain signal processor, in signal communication with the signal sampler, the Doppler shift system and the code signal input, the time domain signal processor operable to shift the signal data by the Doppler shift correction value ... . More specifically, this Doppler shift system applies a Doppler correction to the signals at the input to the matched filter for purposes of Doppler correction, not IF removal. "As

each one millisecond segment from the sample storage device 230 is about to be processed, it is premultiplied by a Doppler shifting circuit (not shown) and then stored in a signal sample register 250." Page 14, lines 1-4. In FIG. 3 of the claimed invention, the Doppler shift system as shown is comprised of a Doppler generator 250 and a complex mixer 260 (see specification, p. 14, line 5). Thus the Doppler block 108 shown in the *Cahn et al.* patent is not the equivalent of this Doppler shift system.

Further, Applicants do not agree that that the time domain signal processor in signal communication with the signal sampler, the Doppler shift system and the code signal input, configured to shift the signal data by the Doppler shift correction value and to determine a correlation between the shifted signal data and the code signal input is described by Fig. 5, block 102, column 15, lines 36-60 of the *Cahn et al.* patent. Applicants note that block 102 as shown in FIG. 5 of the *Cahn et al.* patent is shown as an Application Specific Integrated Circuit or ASIC element on which are implemented SatTRAK channels 38, 40, 42 and 44 and SatProcessor 46. FIG. 3 shows a portion of SatTRAK channel 38. In FIG. 3, satellite signals 72 are demodulated and selected by being multiplied by a correlator 74, that is configured from NOR gates. As such, SatTRAK channels 38, 40, 42 and 44 and SatProcessor 46 of the *Cahn et al.* patent do not show all the claimed structural features of a time domain signal processor in signal communication with a signal sampler, *a Doppler shift system comprised of a Doppler generator and a complex mixer*, and the code signal input, the time domain signal processor operable to shift the signal data by the Doppler shift correction value and to determine a correlation between the shifted signal data and the code signal input.

"Drawings and pictures can anticipate claims if they clearly show the structure which is claimed. ... However, the picture must show all the claimed structural features and how they are put together." MPEP 2125. FIGS. 3, 5, 6 and 9 of the *Cahn et al.* patent do not show all the claimed structural features of a time domain signal processor in signal communication with the signal sampler, the Doppler shift system and the code signal input, *the time domain signal processor operable to shift the signal data by the Doppler shift correction value* and to determine a correlation between the shifted signal data and the code signal input.

Therefore, the *Cahn et al.* patent fails to teach or describe all of Applicants' claim limitations in independent claim 1. Thus independent claim 1 is in condition for allowance.

CLAIMS 2, 5, 6 and 8

Claims 2, 5, 6 and 8 are dependent on allowable claim 1. Therefore, Applicants believe that claims 2, 5, 6 and 8 are also in a condition for allowance and respectfully request that the Examiner withdraw the rejection of these claims.

CLAIM 9

The Examiner states: "[r]egarding claim 9, *Cahn et al.* discloses a method for processing communication data comprising:

receiving (FIG. 3, element 72) signal data;

applying (Figs. 5, 6 and 9, block 108, column 17, lines 1-40, and column 18, lines 55-67)a Doppler shift correction value to the signal data;

receiving (column 15, lines 44-60) a code signal; and

determining (column 15, lines 44-60) a correlation between the Doppler shifted signal data and the code signal in a time domain.

These claims disclose a method for processing communication data wherein a correlation between the Doppler shifted signal data and the code signal is determined in a time domain processor (see FIG. 3, page 14, lines 1-4). In contrast, column 15, lines 44-60 of the *Cahn et al.* patent refers to FIG. 5 and discloses rotating I and Q signals for Doppler shift in 12 channel Doppler Block 108, and then applying the rotated I/Q signals for each SV to Correlator Block 110, shown in FIG. 8, where the I/Q signals are correlated using exclusive OR (or NOR) correlators as provided in FIG. 3. Again, Doppler block 108 operates in IF removal stage and applies the Doppler correction to the signal samples before they are accumulated in the time domain signal processor.

Therefore, the *Cahn et al.* patent fails to teach or describe all of Applicants' claim limitations in independent claim 9. Thus independent claim 9 is in condition for allowance.

CLAIMS 10 and 12

Claims 10 and 12 are dependent on allowable claim 9. Therefore, Applicants believe that claims 10 and 12 are also in a condition for allowance and respectfully request that the Examiner withdraw the rejection of these claims.

CLAIMS 22, 23, 26, 27 and 29

Claims 22, 23, 26, 27 and 29 are rejected on the same basis that they include features found in claims 1, 2, 5, 6 and 8, respectively. Specifically, these are means-plus-function claims for a system with features similar to those found in claims 1, 2, 5, 6 and 8. Accordingly, for Therefore, for the reasons stated above, Applicants believe that the *Cahn et al.* patent fails to teach or describe all of Applicants' claim limitations in independent claim 22. Thus independent claim 22 is in condition for allowance.

Claims 23, 26, 27 and 28 are dependent on allowable claim 22. Therefore, Applicants believe that claims 23, 26, 27 and 28 are also in a condition for allowance and respectfully request that the Examiner withdraw the rejection of these claims.

RESPONSE TO CLAIM REJECTIONS UNDER 35 USC § 103(a)

The Examiner has rejected claims 3, 7, 11, 14, 15, 17-21, 24 and 28 under 35 U.S.C §103(a) as being unpatentable over *Cahn et al.* (U.S. Pat. No. 6,198,765). Specifically, the Examiner acknowledges that *Cahn et al.* does not disclose that the time domain signal processor is a matched signal processor, but also states that it would have been obvious to one of ordinary skill in the art at the time the invention was made that a matched filter processor could have been implemented to perform the same functions as the time domain processor of *Cahn et al.* and that therefore implementing the time domain processor as a matched filter is a design choice and does not constitute patentability. The same rejection was applied to claim 14 as to the matched filter, claims 7 and 11 as to a data bus, and claim 15 as to a signal processor coupled to the signal

sample receiver, the signal processor operable to process the signal data to extract encoded data, in that implementing the claims as noted is a design choice and does not constitute patentability.

Applicants respectfully traverse these rejections. The Examiner has failed to establish a *prima facie* case of obviousness as required by 35 U.S.C. §103(a), the applicable case law and MPEP §2142 because the Examiner has failed to show all of the following: 1) a motivation or suggestion to combine *Cahn et al.* and the additional elements, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference (i.e., *Cahn et al.*) or to combine reference teachings; 2) a reasonable expectation of success; and 3) that *Cahn et al.* and the additional elements when combined teach or suggest all the claim limitations.

The MPEP § 2142 specifically states that the "examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness." Additionally, MPEP § 2142 also states that the "initial burden is on the examiner to provide some suggestion of desirability of doing what the inventor has done. 'To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.'" Official notice unsupported by documentary evidence should only be taken

by the examiner when the facts asserted to be well-known, or to be common knowledge in the art are capable of instant and unquestionable demonstration as being well-known. MPEP § 2144.03 A.

The USPTO cannot meet this requirement by simply stating that it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine elements disclosed in other references with other elements well known in the art, *viz*:

> The "common knowledge and common sense," on which the Board relied in rejecting Lee's application are not the specialized knowledge and expertise contemplated by the Administrative Act. The Board's findings must extend to all material facts and must be documented on the record, lest the "haze of so-called expertise" acquire insulation from accountability. ... "Common knowledge and common sense," even if assumed to derive from the agency's expertise, do not substitute for authority when the law requires authority. *In re Lee*, 277 F.3d 1338, 1344-1345, 61 USPQ2d 1430, 1434 (Fed. Cir. 2002).

Specifically, the Examiner has failed to show that there is a suggestion or motivation to combine *Cahn et al.* with a matched filter processor used as a time domain signal processor because *Cahn et al.* discloses a system and method of correlating a received, code modulated spread spectrum signal with a code modulated signal replica at selected code phase delays and comparing the characteristics of the code correlations. Col. 3, lines 25-32. To accomplish this, an expanded series of correlations are performed with a series of delays a fixed fraction of a chip apart, e.g., one-half the width of a C/A code chip, to provide k-1 sets of n code samples. Col. 11, lines 26-39. The n code samples are correlated with n signal samples in exclusive OR (or NOR correlators). Col.

13, lines 16-20. Thus *Cahn et al.* implements a small, fixed number of correlators to determine if multipath interference is present.

In contrast, in the claimed invention, the time domain signal processor implements a full code period matched filter between the local reference PN code and a full period of received signal sample code and the data is processed in 1 ms segments, corresponding to the period of a GPS PN code. See FIG. 1 and page 13, lines 17-21. Moreover, as the local reference PN code is shifted relative to 1 ms of signal samples, all of the possible PN code phases are tested, not just a number equal to the number of correlators. Page 15, lines 3-7.

Thus *Cahn et al.* discloses a different method from that of the claimed invention; that is, the method of *Cahn et al.* teaches the use of multiple correlators while the claimed invention describes cyclically shifting a code register and repeating the correlation. Therefore, *Cahn et al.* could not reasonably be deemed to teach the use of a matched filter in the system it discloses. Moreover, it would not be obvious to one skilled in the art to combine a matched filter with *Cahn et al.* because of the foregoing differences, which if anything, teach away from the use of a matched filter.

In addition, Applicants believe, for the reasons stated in response to the rejection of claims 1, 2, 5, 6, 8-10, 12, 22, 23, 24, 26, 27 and 29 under 35 U.S.C §102(e), that even if *Cahn et al.* and the elements disclosed in claims 3, 7, 11, 14, 15, 17-21, 24 and 28 were combined, the combination would not teach all of elements of these claims. In other words, *Cahn et al.* does not anticipate claims 1, 2, 5, 6, 8-10, 12, 22, 23, 24, 26, 27 and 29

and therefore, cannot anticipate claims 3, 7, 11, 14, 15, 17-21, 24 and 28 when combined with appropriate element, e.g., a matched filter processor and a data bus.

Based on the foregoing, Applicants respectfully submit that Examiner's statements regarding the combination of *Cahn et al.* and the other features known in the art are without foundation and cannot support a *prima facie* conclusion of obviousness.

RESPONSE TO CLAIM REJECTIONS UNDER 35 USC § 103

The Examiner has rejected claims 39-42 and 43 under 35 U.S.C §103(a) as being unpatentable over *Cahn et al.* (U.S. Pat. No. 6,198,765) in view of *Langberg et al.* (U.S. Pat. No. 5,852,630). The Examiner states that *Langberg et al.* teaches that the method and apparatus for a transceiver warm start activation procedure with precoding can be implemented in software stored in a computer-readable medium and that "one skilled in the art at the time the invention was made would have clearly recognized that the method of *Cahn et al.* would have been implemented into software. ... Therefore, it would have been obvious to have used the software in *Cahn et al.* as taught by *Langberg et al.* in order to reduce cost and improve the adaptability and flexibility of the communication system." Applicants respectfully traverse these rejections.

Applicants' response to the Examiner's rejection of claims 3, 7, 11, 14, 15, 17-21, 24 and 28 under 35 U.S.C §103(a) applies as well to the rejection of claims 39-42 and 43. That is, no suggestion or motivation has been shown to combine the teachings of *Cahn et al.*, which is directed to a spread spectrum receiver with multipath correction, and the

teachings of *Langberg et al.*, which is directed to a transceiver warm start activation procedure with precoding. Nor is there any showing of a reasonable expectation of success should these two be references be combined.

These requirements are not met merely because the references are combined for the purpose of incorporating an element related to software stored in a computer-readable medium. It is well known that "any software process can be transformed into an equivalent hardware process, and any hardware process can be transformed into an equivalent software process." *Overhead Door Corp. v. Chamberlain Group, Inc.*, 194 F.3d 1261, 52 USPQ2d 1321, 1326 (Fed. Cir. 1999). Therefore it is a truism that one skilled in the art can implement any element of his invention in either software or hardware, at his own choosing.

For example, in *Overhead Door Corp.*, the court found that in a means-plus-function element, a "switch means," also covered a software-based embodiment described in a drawing. *Id.* at 1273. However, when looking at a software-based embodiment in the accused product, the court in *Overhead Door Corp.* stated that although the software-based embodiment performed the same function as the corresponding element in the patented product, the software-based embodiment constituted a different "structure" than the software disclosed in the patent because it used a different algorithm to perform the same function. *Id.* at 1273. Thus, in addition to the traditional requirements for modifying or combining the cited references as proposed by the Examiner, there is the additional requirement when determining whether the combined references teach or suggest all the claim limitations that any software-based

embodiments have the same structure, i.e., the algorithms used to perform the function in question must be the same.

This additional requirement has not been met and therefore Applicants respectfully submit that Examiner's statements regarding the combination of *Cahn et al.* and *Langberg et al.* are also conclusory and do not factually support a *prima facie* conclusion of obviousness because the Examiner has failed to show a motivation or suggestion to combine *Cahn et al.* and *Langberg et al.* and a reasonable expectation of success; and that *Cahn et al.* and *Langberg et al.* when combined teach or suggest all the claim limitations.

RESPONSE TO CLAIMS OBJECTED TO AS BEING DEPENDENT UPON A REJECTED BASE CLAIM

The Examiner has objected to claims 4, 13, 16, 25 and 43 as being dependent upon a rejected base claim, but has stated that claims 4, 13, 16, 25 and 43 would be allowable if re-written in independent form including all of the limitations of the base claim and any intervening claims.

In response, Applicants thank the Examiner for allowing claims 4, 13, 16, 25 and 43; however, Applicants believe that re-writing claims 4, 13, 16, 25 and 43 in independent form are not need at this time because, as stated above, the *Cahn et al.* patent fails to teach or describe all of Applicants' claim limitations in independent claims 1, 10, 15, 24 and 39. Thus, independent claims 1, 10 15, 24 and 39 are in condition for

allowance, and dependent claims 4, 13, 16, 25 and 43 that depend from allowable independent claims 1, 10 15, 24 and 39, respectively, are also in condition for allowance.

Therefore, Applicants respectfully request that the Examiner withdraw the objection to claims 4, 13, 16, 25 and 43 because said claims are in condition for allowance.

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CONCLUSION

In light of the above amendments and remarks, it is respectfully submitted that the present application is now in proper condition for allowance, and an early notice to such effect is earnestly solicited.

If any small matter should remain outstanding after the Patent Examiner has had an opportunity to review the above Remarks, the Patent Examiner is respectfully requested to telephone the undersigned patent attorney in order to resolve these matters and avoid the issuance of another Official Action.

Respectfully submitted,
Gronemeyer et al

Dated: November 7, 2004 By: _____

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